

This listing of claims will replace all prior versions and listings of claims in this application:

## Listing of Claims

1. (Currently amended) A pixel for use in an image sensor, ~~formed in a semiconductor substrate processed on one side only~~, comprising:
  - an active area for converting incident radiation into charge carriers of a first and a second charge type,
  - charge-separation ~~means~~ areas located in said active area for separating said charge carriers of the first charge type from said charge carriers of the second charge type, and
  - charge-storage ~~means~~ for storing charge carriers of at least one charge type, said charge-storage ~~means~~ being located in a charge-storage area which is laterally adjacent to said active area, but geometrically separated ~~and electrically isolated~~ from said active area, a readout node provided outside said active area, and an isolation gate arranged between said active area and said readout node for electrically isolating said readout node from said active area,

~~characterized in that wherein~~ said charge-separation ~~means~~ areas comprise at least one floating area and at least two contact areas provided with electric contacts for applying a voltage to said at least two contact areas, said contact areas being electrically ~~isolated~~ insulated from said at least one floating area yet ~~electrically~~ capacitively coupled to at least one of said at least one floating area to generate a lateral electric field to move charge carriers toward the charge storage.
2. (Currently amended) The pixel according to claim 1, wherein said charge-separation ~~means~~ areas comprise an arrangement of a plurality of floating areas, the arrangement being such that neighboring floating areas are electrically ~~isolated~~ insulated from each other yet electrically coupled to each other.

3. (Original) The pixel according to claim 1, wherein said at least one floating area and said at least two contact areas have the same structure.
4. (Original) The pixel according to claim 1, wherein said at least one floating area is a floating photogate, said contact areas being capacitively coupled to at least one of said at least one floating photogate, and, in case of a plurality of floating photogates, neighboring floating photogates being capacitively coupled to each other.
5. (Original) The pixel according to claim 4, wherein said photogates and/or said contact areas are made of polysilicon.
6. (Original) The pixel according to claim 4, wherein a buried channel is provided in said active area below said photogates and said contact areas.
7. (Cancelled)
8. (Cancelled)
9. (Currently amended) The pixel according to claim 1, wherein said charge-storage ~~means comprise~~ comprises a floating diffusion or a floating gate.
10. (Cancelled)
11. (Original) The pixel according to claim 1, wherein at least one coupling capacitor and/or at least one coupling resistor is provided for coupling two neighboring floating areas and/or a contact area to an adjacent floating area.
12. (Currently amended) The pixel according to claim 1, further comprising an electric circuit for reading out said charge carriers stored by said charge-storage ~~means, the circuit being, e.g., a source-follower circuit, a charge-amplifier circuit or a transimpedance-amplifier circuit.~~

13. (Currently amended) The pixel according to claim 1, wherein said charge-storage comprising comprises at least two distinct charge-storage areas.
14. (Original) An image sensor comprising a plurality of pixels arranged in a one- or two-dimensional array,  
characterized in that said pixels are pixels according to claim 1.
15. (Currently amended) The image sensor according to claim 14, wherein the image sensor is of the ~~complementary-metal-oxide-semiconductor, active-pixel-sensor or~~ charged-coupled device type.
16. (Currently amended) A method for sensing incident radiation, comprising ~~the~~ steps of:
- converting the incident radiation into charge carriers of a first and a second charge type in an active area of a semiconductor material ~~processed on one side only~~,
  - generating a lateral electric field at the semiconductor surface in said active area for separating said charge carriers of the first charge type from said charge carriers of the second charge type and transporting said charge carriers, wherein a plurality of floating areas is provided in said active area, and a voltage is applied to at least two contact areas provided in said active area to generate the lateral electric field, said contact areas being electrically insulated from said at least one floating area and capacitively coupled to at least one of said at least one floating area, and
  - storing charge carriers of at least one charge type in a charge-storage area which is laterally adjacent to said active area, but geometrically separated ~~and electrically isolated~~ from said active area while isolating said charge-storage area from a readout node,
  - during read out, transferring said charge carriers from the charge-storage area to said readout node
- characterized in that said lateral electric field is a steplike lateral electric field.

17. (Cancelled)

18. (Currently amended) A method for sensing incident radiation modulated with a modulation frequency, comprising ~~the steps of:~~

converting the incident radiation into charge carriers of a first and a second charge type in an active area of a semiconductor material ~~processed on one side only,~~

generating a lateral electric field at the semiconductor surface in said active area for separating said charge carriers of the first charge type from said charge carriers of the second charge type and transporting said charge carriers, wherein an arrangement of a plurality of floating areas is provided in said active area, and a voltage is applied to at least two contact areas provided in said active area to generate said lateral electric field, said contact areas being electrically insulated from said at least one floating area and capacitively coupled to at least one of said at least one floating area,

periodically changing said lateral electric field synchronously with the modulation frequency of the incident radiation, and  
storing charge carriers of at least one charge type in at least two charge-storage areas which are laterally adjacent to said active area, but geometrically separated and electrically isolated from said active area, ~~characterized in that said lateral electric field is a steplike lateral electric field~~  
during read out, transferring said charge carriers from the charge-storage areas to readout nodes.

19. (Original) The method according to claim 18, wherein  
each period of the modulation frequency is divided into a number of intervals, a separate charge-storage area is provided for each time interval, and charge carriers are stored in the corresponding charge-storage area during each time interval.

20. (Original) The method according to claim 19, wherein the charge carriers stored in said charge-storage areas are read out, and demodulation parameters are calculated from said charge carriers.

21. (Original) The method according to claim 19, wherein charge carriers are stored in said charge-storage areas over more than one period of the modulation frequency.

22. (Original) The method according to claim 20, wherein charge carriers are stored in said charge-storage areas over more than one period of the modulation frequency.

23. (Cancelled)

24. (Cancelled)

25. (Currently amended) The pixel according to claim 12, wherein said charge-storage comprising comprises at least two distinct charge-storage areas.

26. (Cancelled)

27. (Original) An image sensor comprising a plurality of pixels arranged in a one- or two-dimensional array,  
characterized in that  
said pixels are pixels according to claim 25.

28. (Currently amended) The image sensor according to claim [[23]] 14, wherein the image sensor is of the complementary-metal-oxide-semiconductor, ~~active-pixel-sensor or charged-coupled device~~ type.

29. (Currently amended) The image sensor according to claim [[25]] 14, wherein the image sensor is of the ~~complementary-metal-oxide-semiconductor, active-pixel-sensor or charged-coupled device~~ type.